

Claims

- 5 1. Electrical direct current machine (10) including a rotor (26), which is rotatably mounted in a housing (12) and has a plurality of electromagnets spaced from the axis of rotation with a respective coil winding (34) on a coil core (32) carrying one or more electrical conductors, the ends of the electrical conductors constituting the coil being electrically conductively connected to
- 10 respective associated contact elements, which together constitute a first commutator (18a), with a respective contact surface, pressed against which are sliding contacts, which are connectable to at least one direct current source or at least one direct current consumer, and including pole surfaces of permanent magnets (28) with alternating polarity in the peripheral direction, which are
- 15 arranged at uniform angular spacings on the inner surface of the housing end walls (14a, 14b) and are opposed to the end surfaces of the coil cores (32), whereby each coil core (32) together with the associated coil winding constitutes a separately manufactured electromagnet unit (30), which is mounted in a hub carrier (38) rotationally fixedly connected to the shaft (24) of
- 20 the rotor (26), the pole surfaces of the permanent magnets (28) have an extent in the peripheral direction which overlaps with a plurality of opposed coil cores (32) and the two sliding contacts of the commutator associated with a respective radially outwardly situated permanent magnet (28) extends so far in the peripheral direction that they overlap with about half of the contact elements
- 25 associated with a pole surface of a permanent magnet and whereby provided on each pair of sliding contacts (42) connected to the direct current source or the direct current consumer, offset in the peripheral direction, there is a further pair

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of sliding contacts (50) connected in the reverse polarity to the direct current source(s) or direct current consumer and further double pairs of commutator sliding contacts (42; 50), constituting a second commutator (18b), are provided to be connectable to the direct current source(s) or direct current consumer with successively reversed polarity,

characterised in that the first and second commutators (18a; 18b) are so arranged on the rotor shaft (24) in the axial direction of the rotor (26) and axially offset from one another that their contact surfaces (44) associated with the sliding contact (42; 50) are situated, directed radially outwards, on cylindrical envelope surfaces and that the breadth of the sliding contacts (42; 50) measured in the axial direction is so selected that they are pressed simultaneously against the contact surfaces, adjacent in the axial direction, of both commutators (18a; 18b).

2. Direct current machine as claimed in Claim 1, characterised in that the contact surfaces (44) of both commutators (18a; 18b) are connected to coil windings (34) offset from one another in the peripheral direction of the rotor (26), of the electromagnet units (30) of the rotor (26).

3. Direct current machine as claimed in Claim 2, characterised in that the offset of the contact surfaces (44) of the contact elements (40) of the two commutators (18a; 18b) in the peripheral direction is selected to be at least the size of the angular spacing between two successive permanent magnets (28) in the peripheral direction in the housing.

4. Direct current machine as claimed in one of Claims 1 to 3, characterised in that the two commutators (18a; 18b) are arranged on the rotor shaft (24)

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outside the end walls (14a; 14b) of the housing (12) accommodating the rotor (26).

5. Direct current machine as claimed in Claim 4, characterised in that the two commutators (18a; 18b) are arranged in a separate cover (52) arranged on the end wall of the housing (12).

6. Direct current machine as claimed in Claim 5, characterised in that the mountings (46) for the sliding contact (42; 50) are provided in or on the separate cover (52).

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7. Direct current machine as claimed in one of Claims 1 to 6, characterised in that in order to reduce the number of pairs of commutator sliding contacts (42; 50) arranged offset from one another in the peripheral direction, contact elements (40), which are associated with one another and are offset from one another in the peripheral direction, are electrically connected together.

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